

Surgical Outcomes with Insular and Insular-Plus Pediatric Epilepsy: A Single-Institution Experience

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Introduction

It has been increasingly recognized that the insular cortex plays an important role in frontotemporal-parietal epilepsy (FTPE) in children. The insula, however, cannot be properly interrogated with conventional subdural grids, and its anatomy makes it difficult to implicate the insula with semiology or non-invasive modalities. At last year's meeting, we reported on the safety and utility of insular-depth electrode placement for interrogation of the insula. Here, we report post-surgical outcomes on 31 patients with insular-depth electrode confirmed refractory epilepsy.

Methods

We used Current Procedural Terminology (CPT) billing records to identify cases of depth electrode insertion performed at our institution. Clinical information, operative reports, and pathology data from patients undergoing operative intervention was then retrospectively collected.

Conclusions

Surgical resection and thermoablation of the insula are both acceptable treatments for insular and insular-plus epilepsy. In our cohort, outcomes with surgical resection were improved, although the reasons for this are unclear. Further study is required to delineate optimal operative care in patients with insular and insular-plus epilepsy.

Learning Objectives

1. Insular resection and thermoablation for treatment of medically refractory epilepsy are both safe and effective.
2. Indications for insular resection vs. thermoablation are heterogeneous, and a ripe area for further study.
3. Investigation into insular involvement in seizure semiology may be indicated in pediatric patients with medically refractory epilepsy.

Results

Thirty-one patients underwent direct invasive sampling implicating the insula in seizure onset and prompted either thermoablation or surgical resection of some portion of the insula. Fourteen patients had biopsy-proven cortical dysplasia, Fourteen patients had suspected cortical dysplasia, two patients had tuberous sclerosis and one patient had a primary brain tumor. Fourteen patients had prior intracranial operations. Fourteen patients underwent thermoablation of the insula and seventeen underwent resection of some portion of the insula. 31% of patients who underwent thermoablation of the insular had an Engel Class outcome of I compared to 63% of patients who underwent open insular resection. Thus, in our cohort, insular resection was superior to thermoablation in achieving superior functional outcomes as measured by Engel Class.

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